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the number of officers gives the results as shown in the last vertical column of the table appended. The figures in the second and third columns are transcribed from the article referred to above.

Institution.	No. of Students.	No. of Officers.	No. of Students to One Officer.
California	3,130	330	9.48
Chicago	2,218	184	12.54
Columbia	4,056	551	7.36
Cornell	3,364	451	7.45
Harvard	4,516	534	8.45
Illinois	3,233	365	8.85
Indiana	882	72	12.25
Johns Hopkins	740	156	4.74
Leland Stanford Jr.	1,420	130	10.92
Michigan	3,667	270	13.58
Minnesota	3.671	197	18.63
Missouri	1,536	88	17.45
Nebraska	2,414	173	13.95
Northwestern	2,806	346	8.10
Ohio State	1,723	143	12.04
Pennsylvania	2,940	330	8.90
Princeton	1,385	114	12.14
Syracuse	2,419	201	12.03
Virginia	691	45	15.35
Wisconsin	2,668	243	10.97
Yale	2,995	330	9.07

William B. Schober.

Lehigh University,
January 5, 1905.

SCHOOLS OF TECHNOLOGY AND THE UNIVERSITY.

To the Editor of Science: In connection with the proposed combination of the Massachusetts Institute of Technology with Harvard University, the following authoritative statement of foreign opinion (translated from *Zeitschrift des Vereines deutscher Ingenieure* of September 24, 1904) is of interest:

> At a meeting of the Union of German Engineers, held at Munich September 12, with the participation of thirty eminent representatives of technological schools and universities, as well as of other schools and of industries, the following resolutions were adopted:
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> 1. It is not advisable, so far as can be foreseen, to attempt to meet the need of new technological schools by the addition of technological faculties to universities, but rather by the establishment of independent institutions; for the technological schools would be hindered in their independent development by attaching them to universities. This separation should not, however, impede the welcome development of intellectual good will between the two institutions. The attachment to universities would also in no way involve economies of consequence.
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> 2. The Union of German Engineers stands now, as before, by its expression of 1886, as follows: "We declare that the German engineers have the same needs and will be subjected to the same judgment as to their general culture as the representatives of other professions based on higher scientific education." In this view we rejoice as the conviction more and more gains ground that a considerably greater significance is to be attributed than before to mathematical and natural science as a means of culture. Knowledge of these branches is becoming more and more an indispensable constituent of general education. The predominantly linguistic education now received by the majority of our gymnasium graduates does not satisfy the demands which must be made on the leading classes of our people, in particular, in respect to the increasing significance of economic questions.

Tech Graduate.

SPECIAL ARTICLES.

PROPOSED INTERNATIONAL PHONETIC CONFERENCE TO ADOPT A UNIVERSAL ALPHABET.*

I wish to call your attention to a circular recently issued by Boston University, inviting opinions on the proposal to hold an international conference for the purpose of adopting a universal alphabet. In the Roman alphabet we already have a practically universal alphabet. A comparatively slight effort will suffice to make it perfect and quite universal. Whoever has looked into the subject knows that it is perfectly practicable to introduce such modifications in the Roman alphabet as to make it perfectly phonetic and yet leave the spelling in such condition that it shall be readily legible to people who know only the Roman alphabet in its present form.

I need not dilate on the advantages to be expected from the use of an alphabet which would enable every child to read as soon as it knew the letters, and which would, furthermore, enable any one to pronounce foreign languages correctly at a glance, because their spelling, apart from a few special sounds, would be the same as in his own language. It is easy to see how this would promote pleasant intercourse and mutual understanding among the nations, by facilitating the acquisition of foreign languages. All the leading languages would thus tend to expand and to become cosmopolitan; but most of all would this be true of English, which is more hindered in its expansion by its spelling than any other language. It is, perhaps, not too much to say that the universal alphabet will confer on the English language the patent of universality.

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* Read before the Comparative Philology Section of the Language Group of the Congress of Arts and Science at St. Louis, September 21, 1904.

To prepare such an alphabet is a comparatively easy task. The real problem is how to get it accepted by the public. Scores of such alphabets exist already, but not one of them possesses sufficient authority to compel its universal use. How shall such authority be secured?

To this question the circular recently issued by Boston University seeks to obtain an answer. It invites opinions on the plan to hold an international conference for the purpose of adopting a universal alphabet to be used first of all as a key to pronunciation in all dictionaries of the leading languages. I may state at once that the replies received from the editors and publishers of the great American dictionaries are highly encouraging. They state with practical unanimity that, if a universal alphabet were drawn up by a commission composed of the foremost experts, and invested with the requisite authority by scientific bodies of high standing, they would introduce that alphabet as a key to pronunciation in future editions of dictionaries, primers, readers, grammars and language manuals as fast as practicable.

It is evident that, if the dictionaries adopt this universal alphabet, a large part of the rising generation will become familiar with it. It will be used by everybody who wishes to indicate pronunciation. It is even probable that the entire rising generation will soon grow accustomed to it, for the following reasons: Experiment has proved that children beginning with a phonetic alphabet learn to read in a few weeks and master even the ordinary spelling more rapidly than by the present method. The reason is evident. The essential part of the art of reading consists in the ability to recognize the outline of a word at a glance, without having to spell out the letters. Having in a few weeks acquired the ability to recognize words in the phonetic spelling, children will recognize them also in the traditional spelling, because the difference in the outline will in most cases not be great. We see this daily illustrated by the ease with which school-bred immigrants learn to read English, though accustomed at home to a totally different spelling. Having acquired in their own language the ability to recognize whole words at a glance, they soon begin to recognize also English words whose meaning they have learned from conversation.

When the universal alphabet has been adopted in the dictionaries, it is certain that the experiment of beginning with it in the primary schools will be made in many parts of the country, for the movement has many friends among educators. When the results of these experiments become generally known, it will not be long before all the schools begin with the universal alphabet. For some time they will doubtless use it merely as an easier method to teach the traditional spelling; but when it is found that children, after two months of schooling, are able to read any book printed in the phonetic spelling, the question will soon be raised why they should be forced to spend another year or more in learning another spelling.

It will be noted that the acceptance of the universal alphabet by the dictionaries was made subject to an if. They are willing to use this alphabet if it is presented to them invested with a sufficient degree of authority. Nothing should be neglected that can add to this authority. Hence the commission which is to prepare the universal alphabet must fulfil four conditions:

1. It should be composed of the foremost experts in phonetics.

2. They should be invested with representative power by learned bodies of the highest standing.

3. They should receive their final commissions from the various governments.

4. They should conduct their work not merely by correspondence, but should have at least one meeting, preferably several meetings, occupying an adequate length of time.

The scholars able to do the work exist; it only remains to enable them to organize. For this purpose, the circular issued by Boston University is to serve as a preliminary step. Its aim is to obtain the opinion of the learned public. Thus far it has been sent only to the members of the Philological Association, and it may be stated that out of 67 replies received up to September 16, only 4 questioned the utility of the conference, the great majority being emphatic and even enthusiastic in its advocacy. In a few weeks the circular will be sent to every university professor in the United States and Canada.

The question has several times been asked, why a conference of the English-speaking nations alone would not suffice. The answer may be gathered from what has been said above. The supreme need of the phonetic alphabet, in order to secure its adoption by the public, is authority; and of course the authority of a universal alphabet, adopted by an international commission, would far exceed that of an alphabet devised for one language only. It is desirable to secure the use of the alphabet by the largest possible number of persons at once, in order to impart to it the requisite momentum to carry it into popular use. Evidently the momentum of an international alphabet will be incomparably greater than that of a merely national alphabet. Above all, it must be remembered that the sounds of the leading European languages are for the most part nearly identical, and that all the nations are striving to adopt phonetic alphabets. If now each nation does this for itself, we shall be confronted with the dilemma that either needless differences will be permanently established between the languages, or, if there is to be identity of writing to correspond with the practical identity of sounds, certain nations will be forced to abandon their laboriously constructed systems in order to conform to the system of another nation. The obvious remedy, the reasonable, neighborly, courteous method is an agreement by the common consent of all the nations concerned, and now is the time to secure it, while as yet none of the national phonetic alphabets have found any notable degree of acceptance.

The realization of the conference is simply a matter of expense. It means that a dozen or a score of the most eminent scholars shall be enabled to devote the requisite time to it. If the replies to the circular demonstrate that the great majority of the learned public favors the plan, it seems entirely probable, in view of the importance of the subject, that the requisite funds will be forthcoming.

Robert Stein.

U. S. Geological Survey,
Washington, D. C.

AWARDS TO THE COLLECTIVE EXHIBIT OF THE LAND-GRANT COLLEGES AND THE EXPERIMENT STATIONS.

The collective exhibit of the American colleges of agriculture and mechanic arts and the experiment stations at the St. Louis Exposition, illustrating special features of the instruction work of these institutions and the methods and results of the agricultural experiment stations, was awarded 27 grand prizes, 37 gold medals, 35 silver medals and 35 bronze medals, a total of 135 awards, aside from those made to individual exhibitors. The collective exhibit as a whole received a grand prize; and similar awards were made to the sections of agronomy, in charge of Mr. J. I. Schulte, of the office of experiment stations; of horticulture and forestry, in charge of Professor S. B. Green, of Minnesota; of economic entomology, in charge of Professor C. P. Gillette, of Colorado; of mining engineering, in charge of Professor S. B. Christy, of California; of architecture, in charge of Professor W. H. Lawrence, of Massachusetts; of mechanical engineering, in charge of Professor W. F. M. Goss, of Indiana; of drawing and shop practice, in charge of Professor F. P. Anderson, of Kentucky; and of technical chemistry, in charge of Dr. W. H. Walker, of Massachusetts; to the dairy laboratory, in charge of Professor E. H. Farrington, of Wisconsin; the sugar laboratory, in charge of Dr. W. C. Stubbs, of Louisiana; and the plant laboratory,